National Institute of Environmental Health Sciences

Human mortality seasonality in Castile-Leon, Spain, between 1980 and 1998: The influence of temperature, pressure and humidity

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Abstract:

This study was carried out in the region of Castile and Leon, Spain, from 1980 to 1998 and analyzes the relationship between the number of monthly deaths caused by cardiovascular, respiratory and digestive diseases and three meteorological variables: temperature, pressure and humidity. One of the innovations in this study is the application of principal component analysis in a way that differs from its usual application: one single series representing the whole region was constructed for each meteorological variable from the series of eight weather stations. Annual and seasonal mortality trends were also studied. Cardiovascular diseases are the leading cause of death in Castile and Leon. The mortality related to cardiovascular, respiratory and digestive systems shows a statistically significant rising trend across the study period (an annual increase of 6, 16 and 4 per thousand, respectively). The pressure at which mortality is lowest is approximately the same for all causes of death (about 915 hPa), but temperature values vary greatly (16.8-19.7 degrees C for the mean, 10.9-18.1 degrees C for the minimum, and 24.1-27.2 degrees C for the maximum temperature). The most comfortable temperatures for patients with cardiovascular diseases (16.8 degrees C) are apparently lower than those for patients with respiratory diseases (18.1 degrees C), which are, in turn, lower than in the case of diseases of the digestive system (19.7 degrees C). Finally, the optimal humidity for patients with respiratory diseases is the lowest (24%) among the diseases, and the highest (51%) corresponds to diseases of the digestive system, while the optimal relative humidity for the cardiovascular system is 45%.

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Resource Description

Exposure : ☑

weather or climate related pathway by which climate change affects health

Meteorological Factors, Meteorological Factors, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Spain

Health Impact:

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Respiratory Effect, Other Health Impact

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular disease mortality

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory disease mortality

Other Health Impact: digestive disease mortality

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified